

0039

C/041/002 Incoming
#3369

Canyon Fuel
Company, LLC.
Sufco Mine

A Subsidiary of Arch Western Bituminous Group, LLC.

COPY

Ken May, General Manager
597 South SR 24
Salina, UT 84654
(435) 286-4400 - Office
(435) 286-4499- Fax

8

August 14, 2009

Mr. Daron Haddock
Permit Supervisor
Utah Coal Regulatory Program
Utah Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
P. O. Box 145801
Salt Lake City, Utah 84114-5801

File in:

☐ Confidential

☐ Shelf

☒ Expandable

Refer to Record No. 0039 Date 08/14/2009

In C/041/0002, 2009 Incoming

For additional information

Confidential!

RECEIVED

AUG 24 2009

DIV. OF OIL, GAS & MINING

RE: New 5-Year Mining Plan Update Amendment to the Canyon Fuel Company, LLC, Sufco Mine, Permit Number C/041/0002

Dear Mr. Haddock:

Please find enclosed with this letter the Sufco Mine permit amendment to update the mining design and 5-year sequence plan in the mine's M&RP. We have included five copies of the modified text in redline/strikethrough format along with completed C1 and C2 forms. Clean copies of the pages with modifications will be forwarded to the Division once the modification is approved for inclusion in the permit.

Sufco's mining plans have changed from previous projections as described below. Plates 5-7 and 5-8 show the general layout of the panels and mains for continuous miner and longwall mining along with timing.

The longwall at Sufco is currently operating in the East Mains area on the northern Quitcupah and SITLA tracts and will be until mid 2012. The projections above 2 East Mains previously consisted of two short 1110 ft wide separate district panels. Current projections consist of bleeder entries and three short panels connected to the East Mains panels at 5LEM's. These panels are situated completely on the SITLA tract and will increase the recoverable tons in this area by approximately 1.3 M tons.

Development for the 2 South sub-mains and corresponding two longwall panels off of 4 West will start around the 3rd quarter of 2010. These two panels have been projected farther to the west. The 1R2S will cross out of the corner of lease U-47080 and then into lease U-63214. A modification to lease U-63214 is currently in process and will increase the acreage of this lease to accommodate this plan. Panel 2R2South A will undermine a portion of the South Fork Quitcupah Stream channel. Because of the nature of the fine-grained sediments that form the stream channel floor in the South Fork of Quitcupah, surface cracks, if any, are anticipated to be very narrow in width and would self heal rapidly. Mining within the panel will stop where the angle-of-draw of subsidence is projected to the surface and intercepts a point where 10 ft. of

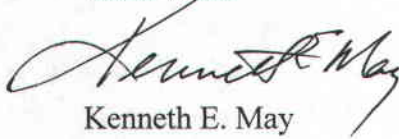
Permit Supervisor
Utah Coal Regulatory Program
August 14, 2009
Page 2

COPY

sediment overlies exposed Castlegate Sandstone within the stream channel. Mining will then recommence in panel 2R2South B at a point where the horizontal distance on the surface equals a 50 foot stream buffer plus 228 feet that incorporates the subsidence angle-of-draw. Where mining recommences and potential subsidence effects may occur, the canyon walls do not have high rock ledges or escarpments but consists of sloping rock and soil. Leaving this block of unmined coal is intended to protect the area where the South Fork of Quitchupah flows in a deeply incised canyon over exposed Castlegate Sandstone. The anticipated tonnage increase in these panels is 1.2 M tons.

If you have any questions regarding the information contained in this letter or within the permit modification, please give Mike Davis a call at (435) 286-4421.

Sincerely,
CANYON FUEL COMPANY, LLC
Sufco Mine



Kenneth E. May
General Manager

Encl.

cc: DOGM Correspondence File

KEM/MLD:kb

APPLICATION FOR COAL PERMIT PROCESSING

COPY

Permit Change ☒ New Permit ☐ Renewal ☐ Exploration ☐ Bond Release ☐ Transfer ☐

Permittee: CANYON FUEL COMPANY, LLC

Mine: SUFCO MINE

Permit Number: C/041/002

Title: 5-Year Plan Update

Description: Include reason for application and timing required to implement:

Mining design and mine sequence and timing 5-year update.

Instructions: If you answer yes to any of the first eight (gray) questions, this application may require Public Notice publication.

- ☐ Yes ☒ No 1. Change in the size of the Permit Area? Acres: _____ Disturbed Area: _____ ☐ increase ☐ decrease.
- ☐ Yes ☒ No 2. Is the application submitted as a result of a Division Order? DO# _____
- ☐ Yes ☒ No 3. Does the application include operations outside a previously identified Cumulative Hydrologic Impact Area?
- ☐ Yes ☒ No 4. Does the application include operations in hydrologic basins other than as currently approved?
- ☐ Yes ☒ No 5. Does the application result from cancellation, reduction or increase of insurance or reclamation bond?
- ☐ Yes ☒ No 6. Does the application require or include public notice publication?
- ☐ Yes ☒ No 7. Does the application require or include ownership, control, right-of-entry, or compliance information?
- ☐ Yes ☒ No 8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
- ☐ Yes ☒ No 9. Is the application submitted as a result of a Violation? NOV # _____
- ☐ Yes ☒ No 10. Is the application submitted as a result of other laws or regulations or policies?
Explain: _____
- ☐ Yes ☒ No 11. Does the application affect the surface landowner or change the post mining land use?
- ☒ Yes ☐ No 12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2)
- ☐ Yes ☒ No 13. Does the application require or include collection and reporting of any baseline information?
- ☐ Yes ☒ No 14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
- ☐ Yes ☒ No 15. Does the application require or include soil removal, storage or placement?
- ☐ Yes ☒ No 16. Does the application require or include vegetation monitoring, removal or revegetation activities?
- ☐ Yes ☒ No 17. Does the application require or include construction, modification, or removal of surface facilities?
- ☐ Yes ☒ No 18. Does the application require or include water monitoring, sediment or drainage control measures?
- ☒ Yes ☐ No 19. Does the application require or include certified designs, maps or calculation?
- ☐ Yes ☒ No 20. Does the application require or include subsidence control or monitoring?
- ☐ Yes ☒ No 21. Have reclamation costs for bonding been provided?
- ☐ Yes ☒ No 22. Does the application involve a perennial stream, a stream buffer zone or discharges to a stream?
- ☐ Yes ☒ No 23. Does the application affect permits issued by other agencies or permits issued to other entities?

Please attach four (4) review copies of the application. If the mine is on or adjacent to Forest Service land please submit five (5) copies, thank you. (These numbers include a copy for the Price Field Office)

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.

KENNETH E. MAY, MINE MANAGER
Print Name

Kenneth E. May 3/19/09
Sign Name, Position, Date

Subscribed and sworn to before me this 19th day of August, 20 09

Notary Public

My commission Expires: _____, 20 _____

Attest: State of _____ } ss:
County of _____ }



NOTARY PUBLIC
JILL WHITE
70 W 300 S
Gunnison, UT 84634
My Commission Expires
March 28, 2012
STATE OF UTAH

For Office Use Only:

**Assigned Tracking
Number:**

Received by Oil, Gas & Mining

RECEIVED
AUG 24 2009

DIV. OF OIL, GAS & MINING

APPLICATION FOR COAL PERMIT PROCESSING

Detailed Schedule Of Changes to the Mining And Reclamation Plan

Permittee: CANYON FUEL COMPANY, LLC

Mine: SUFCO MINE

Permit Number: C/041/002

Title: 5-Year Plan Update

Provide a detailed listing of all changes to the Mining and Reclamation Plan, which is required as a result of this proposed permit application. Individually list all maps and drawings that are added, replaced, or removed from the plan. Include changes to the table of contents, section of the plan, or other information as needed to specifically locate, identify and revise the existing Mining and Reclamation Plan. Include page, section and drawing number as part of the description.

DESCRIPTION OF MAP, TEXT, OR MATERIAL TO BE CHANGED

[illegible]

Any other specific or special instruction required for insertion of this proposal into the Mining and Reclamation Plan.

Received by Oil, Gas & Mining

RECEIVED

AUG 24 2009

DIV. OF OIL, GAS & MINING

CHAPTER 5
ENGINEERING

mine where similar geomorphologic and geologic conditions occur. This program was developed and implemented by the Fall of 2000. Subsidence cracks in the area of the West Fork of Box Canyon were surveyed for their location. However, in the years 2000 through 2003 the width and/or offset of the cracks were not measured or the records were not kept. Width and/or offset measurements were made in the Fall of 2004 and will again be made in the Fall of 2005 and every year thereafter. It is believed by the permittee that any change in the width of the cracks can easily be tracked on an annual basis rather than a semi-annual basis. The permittee has observed that most subsidence cracks that develop in the mining area do not change significantly after the first 4 to 6 months following their creation. The crack measurement records will be reported in the mines annual report. Subsidence cracks in the area of the West Fork of Box Canyon are located in Longwall area 10 that has been mined out since 2001, and the area is now assumed to be dormant. 2008 will be the last year these cracks will be monitored since there will not be anymore movement in this area.

Anticipated Effects of Subsidence. Future subsidence in the permit area is anticipated to be similar to that which has occurred in the past. Subsidence is expected to average about 4 feet above longwall panels, with a draw angle of about 15 degrees. Tension cracks are expected to occur in areas of subsidence with these cracks healing to some degree following formation. Tension cracks are anticipated to be less pronounced above longwall workings than above continuous-miner workings.

Previous surveys have indicated that no substantial damage has occurred to vegetation as a result of subsidence within the permit area. The only effects observed have been exposed plant roots where tension cracks have formed.

It is anticipated that subsiding under portions of East Fork Box Canyon and South Fork Quitcupah will result in a slight flattening of the stream gradient, which will increase pooling of the stream through a stretch of several hundred feet of the stream. Cracks will also likely develop across the East Fork Box Canyon Creek directly above the longwall panels and along the gate roads. These crack zones will form shortly after undermining of the stream bed. They are anticipated to be 1 to

2 inches or less in width with these cracks healing to some degree following formation. Details of the expected location of the cracks are given in Appendix 7-19. Because of the nature of the fine-grained sediments that form the stream channel floor in the South Fork of Quitcupah, surface cracks - if any form - are anticipated to be very narrow in width and would self heal rapidly. However, if cracks do develop in the channel floor and appear to be taking surface water from the creek, sealing of these cracks will be done with bentonite grout. Use of bentonite grout for the sealing of the cracks in the channel floor is discussed in Section 3 of the Pines Tract FEIS (1999) and in more detail in the following section.

East Fork of Box Canyon Subsidence Monitoring and Mitigation

Portions of the East Fork of Box Canyon will be undermined and subsided as longwall panels 3LPE and 4LPE are extracted in 2003 through 2005. A monitoring plan that is more intensive than the general permit area has been proposed for monitoring vegetation, surface and ground water flows, and subsidence cracks and repair of the cracks in the portions of the East Fork to be undermined. The subsidence portion of the monitoring program is discussed in detail in the following text.

Prior to the initiation of undermining and subsidence, a presubsidence survey will be conducted in the East Fork of Box Canyon from the Joe's Mill Ponds downstream to a location above the west gate roads associated with the 3LPE panel. The survey will consist of video taping the condition of the stream channel paying particular note to surface flows and ground water discharge, vegetation types and conditions, animal life in the area including macroinvertebrates in the stream channel, soil conditions, and the general geomorphology of the area. A follow-up video survey will be made at the same time of year on the third year following undermining during September of 2008. A general comparison between the two tapes will be made to determine what, if any, effects to the parameters described above have occurred. The biological aspects of the video tape are discussed in greater detail in Section 3.2.2.2 while the monitoring of surface and ground water flows are discussed in Section 7.3.1.2.

BLM. A similar mining schedule was successfully implemented at the Canyon Fuel Company Skyline Mine while the lower sections of Burnout Canyon were undermined. No damage to the stream channel or reduction in stream flows were noted as a result of undermining that portion of Burnout Canyon using the approved mining schedule.

A weekly report will be submitted via e-mail to the Division detailing the results of the inspections. The reports will include, but not necessarily be limited to: a map illustrating the current location of the longwall face; descriptions and dates of field activities; noted changes in stream and local geomorphology; location, width, frequency of cracks; and a description of repairs, if any, conducted. If the prescribed inspections cannot be conducted, the reason for the missed inspection and a record of the attempt to conduct the inspection will be submitted to the Division in the weekly report. The Division will be notified immediately after mining-induced cracks, if any, are found in the East Fork stream channel and the steps taken or planned to be taken as mitigation. Thereafter, the Division will be advised of continuing mitigation efforts, if needed, in the weekly report.

A copy of the October 2003 "Monitoring and Mitigation Plan for Mining Under the East Fork of Box Canyon" prepared by the Division and reviewed and accepted by the Forest with some modifications has been included in Appendix 3-10. The preceding paragraphs have been prepared based on this plan. Sufco will meet all of the monitoring and mitigation responsibilities described in the plan as it pertains to the undermining of the East Fork of Box Canyon.

South Fork of Quitchupah Subsidence Monitoring and Mitigation

Portions of the South Fork of Quitchupah where alluvial and the Price River Formation cover overlying the Castlegate Sandstone exceeds a thickness of 10 feet will be undermined and subsided as longwall panel 2R2S is extracted. A monitoring plan that is more intensive than the general permit area has been proposed for monitoring surface and ground water flows, and subsidence cracks and repair of the cracks in the portions of the South Fork of Quitchupah channel to be undermined. The subsidence portion of the monitoring program is discussed in detail in the following text.

Prior to the initiation of undermining and subsidence, a presubsidence survey will be conducted in the South Fork of Quitchupah to a location above the gate roads associated with the 2R2S panel. The survey will consist of a gain/loss survey of the condition of the stream channel paying particular note to surface flows and ground water discharge, soil conditions, and the general geomorphology of the area. The monitoring of surface and ground water flows are discussed in greater detail in Section 7.3.1.2.

The subsidence monitoring plan for the South Fork of Quitchupah will include frequent inspection of the stream channel during and after active subsidence. While mining is occurring under the stream channel and within the 15-degree angle-of-draw above the active longwall face, that area of the channel will be inspected every two weeks for subsidence cracks or other related features.

As the longwall face advances and the 15-degree angle-of-draw area follows, the portions of the channel that now lie outside the 15-degree angle-of-draw will be monitored for subsidence features on a quarterly basis for two years following the cessation of subsidence related effects, if any, due to mining.

Mitigation of cracks that would appear to interrupt or divert flows from the stream channel will be sealed immediately with bentonite. Sufco will use hand placement methods when sealing cracks with bentonite, with an adequate volume of bentonite, in powder, granular, and/or chip form, to seal small cracks. The bentonite may be placed by pouring it directly into the crack and hydrating with stream water or, if in an actively flowing portion of the stream, temporarily diverting the flow around successive portions of the crack using native soils and placing the bentonite in the exposed section of the crack until the crack is sealed. If cracks are present in channel walls defined by soil, the soil cracks will be hand filled using a native soil/bentonite mix. The sealing of the channel floor and walls will be accomplished with hand tools such as shovel, picks, trowels, etc. In the unlikely event that cracks too large to be sealed through the efforts of one or two persons in one day do occur and it appears there is a danger of water being diverted from the channel for an extended period of time, arrangements will be made to get additional help to the site as soon as possible.

Sufco will conduct longwall mining operations in such a manner as to minimize surface disturbance while mining within the 15-degree angle-of-draw area that includes the South Fork stream channel. This will be accomplished by advancing the longwall on a schedule where mining will not be suspended for a period to exceed 48 hours.

A report on the impacts, if any, will be submitted via e-mail to the Division detailing the results of the inspections while mining is occurring under the stream channel. The reports will include, but not necessarily be limited to: a map illustrating the current location of the longwall face; descriptions and dates of field activities; noted changes in stream and local geomorphology; location, width, frequency of cracks; and a description of repairs, if any, conducted. If the prescribed inspections cannot be conducted, the reason for the missed inspection and a record of the attempt to conduct the inspection will be submitted to the Division in the report. The Division will be notified immediately after mining-induced cracks, if any, are found in the South Fork stream channel and the steps taken or planned to be taken as mitigation. Thereafter, the Division will be advised of continuing mitigation efforts, if needed, in the report.

Though not anticipated, short segments of Cowboy Creek could be subsided in the SITLA Muddy Tract. If this is anticipated to occur, Sufco, will submit a plan for mitigation to address, if it occurs, adverse impacts to Cowboy Creek. With the approval of the Division and concurrence of the Forest, Sufco will instigate a flow monitoring plan similar to the plan implemented prior to the undermining of the East Fork of Box Canyon. If mitigation of surface cracks are required, methods similar to those proposed and implemented in the East Fork of Box Canyon as described above could be used.

Mining within the area of the East Fork of the Box Canyon, South Fork of Quitchupah and within the area of Cowboy Canyon in the SITLA Muddy Tract will be conducted in accordance with State and Federal rules and regulations and the requirements and stipulations presented in the BLM's Conditions of Approval of the Resource Recovery and Protection Plan (July 31, 2003) located in Appendix 1-2. A survey of the water quality and quantity of surface and groundwater, including State appropriated waters, within the SITLA Muddy Tract has been completed. The results of the

area survey are included in the PHC for the SITLA Muddy Tract and included in Appendix 7-20. Ground and surface waters in the tract that have attached rights are listed in Appendix 7-1.

A discussion regarding the methods Sufco would employ to mitigate and replace an adversely affected State appropriated water supply is provided in Chapter 7, Section 7.3.1.8.

5.2.5.2 Subsidence Control

Adopted Control Measures. As indicated above, SUFCO Mine has adopted subsidence-control measures in areas where surface resources are to remain protected. These controls consist primarily of leaving support pillars in place in those areas designated on Plates 5-10A & 5-10B as not planned for subsidence. Based on experience and data collected from the permit area, the design of support pillars for those areas where subsidence is not planned has been based on the following equations:

$$SF = SD/OS \quad (5-1)$$

where SF = safety factor against pillar failure (fraction)

SD = support strength density (psi)
= $(Y_c)(1-ER)$

Y_c = average compressive yield strength of the coal (psi)
= 3090 psi for the Upper Hiawatha seam

ER = extraction ratio (fraction)
= $1-(A_p/A_t)$

A_p = pillar area (ft²)

A_t = area supported by pillar (ft²)

OS = overburden stress (psi)
= $(d)(D_o)/144$

d = overburden depth (ft)

D_o = overburden density (lb/ft³)
= 160 lb/ft³ for the permit area

Based on these equations and data, the support pillar designs summarized in Table 5-3 have been derived. This equation does not take into account either size effect or shape effects and is based on a one-dimensional stress field. Historically this equation has provided good results when used in areas where a number of uniform pillars are extracted. One area (5 North panels) of the mine experienced pillar failure when the area was flooded with water after mining of the panels had been completed. This particular area was mined using a double pass technique and the mining height was from 14 to 18 feet. The resulting pillars varied from 25 feet x 25 feet to 40 feet x 40 feet. The underlying floor was a weak mudstone that lost its cohesive strength when wet. When the 1R5N and 2R5N panels were flooded the underlying mudstone became saturated and lost its cohesive strength. This allowed the pillars in the area with $SF < 2.5$ to fail, because frictional confinement on the bottom of the pillar was lost. To prevent reoccurrence the Applicant will commit to not flood areas of the mine that have small pillars and a weak mudstone floor in areas where subsidence is to be prevented.

Compliance With Control Plan. SUFCO Mine will comply with all provisions of the approved subsidence control plan.

Correction of Material Damage. ~~No material damage of surface resources is anticipated~~ SUFCO Mine will try to plan mining operations so that no material damage occurs as a result of subsidence in the permit area. However, should material damage occur, SUFCO Mine will correct any material damage resulting from subsidence caused to surface lands to the extent technologically and economically feasible by restoring the land to a condition capable

CHAPTER 7
HYDROLOGY

TABLE 7-2
Water Monitoring Program

<u>Monitoring Wells</u>	<u>Protocol</u>	<u>Comments</u>
US-80-2	A	Screened in Castlegate Sandstone
US-80-4	B	Screened in Castlegate Sandstone
89-20-2W	A	Screened in Castlegate Sandstone
US-79-13	B	Screened in Blackhawk Formation
US-81-4	A	Screened in Blackhawk Formation
01-8-1	A	Screened in Blackhawk Formation
<u>Streams</u>		
SUFCA 006	C,2	upper South Fork Quitcupah Creek
SUFCA 006A	F,1	upper South Fork Quitcupah Creek
SUFCA 006B	F,1	upper South Fork Quitcupah Creek
SUFCA 007	C,2	upper North Fork Quitcupah Creek
SUFCA 041	C,2	lower Quitcupah Creek
SUFCA 042	C,2	lower North Fork Quitcupah Creek
SUFCA 046	C,2	upper Quitcupah Creek
SUFCA 047A	C,2	lower East Spring Canyon Creek
SUFCA 090	C,1	upper Box Canyon Creek
Pines 106	C,2	upper East Fork Box Canyon
Pines 302	C,1	Muddy Creek-Last Water Creek Confluence
Pines 403	C,2	lower Box Canyon Creek
Pines 405	C,1	Muddy Creek - Box Creek Confluence
Pines 406b*	C,1	lower Muddy Creek
Pines 407	FC,1	Box Canyon Creek
Pines 408	FC,1	East Fork Box Canyon Creek
USFS-109	C,1	upper Main Fork of Box Canyon Creek
Link 001	C,2	Link Canyon Drainage
Link 002	C,2	Link Canyon Drainage
FP-1	G,6	East Fork of Main Fork of Box Canyon
FP-2	G,6	East Fork of East Fork of Box Canyon
M-STR4	C,1	Cowboy Creek

*Monitoring point Pines 406 was moved downstream to the USGS monitoring point in 1999 and renumbered as Pines 406b. The point is located in the NW1/4NE1/4, Sec. 21, T21S. R6E.

TABLE 7-3
Field and Laboratory Measurement Protocol

Water level and flow measurements

- A Monitoring well: quarterly water level measurement
- B Monitoring well: annual water level measurement (3rd quarter)
- C Stream: quarterly discharge measurements
- D Spring: quarterly discharge measurements
- E Spring Pool: quarterly water level measurement
- F Stream: ~~weekly measurements in 1999 June through October, thereafter monthly July through October.~~ Bi-weekly measurements while mining is occurring under the stream in 2013, thereafter quarterly for two years.
- G Stream: identify perennial portion of stream on or near October 1 of each year.

Water quality

- 1 Stream: quarterly surface water quality field measurements
- 2 Stream: quarterly surface water quality operational laboratory measurements
- 3 Spring: quarterly groundwater quality field measurements
- 4 Spring: quarterly groundwater quality operational laboratory measurements
- 5 Spring: groundwater quality operational laboratory measurements quarterly for two (2) years, then reverting to quarterly water quality field measurements
- 6 Stream: flow measurements only, no water quality samples required.
- 7 Spring: initially ground water field measurements June 2006 through December 2006 as accessible then quarterly groundwater field measurements thereafter.

essentially no tritium. Modern surface waters contain abundant tritium. They visited this site again in June 1996 and located several springs in the drainage several hundred feet above where samples are collected and classified the site as a spring-monitoring site. Nevertheless, Mayo now agrees with SUFCO that this site should be considered a surface water site for monitoring purposes because, at times, this drainage has flow which is contributed by snow melt, precipitation, or sediment pond discharge.

Monitoring sites are sampled three times per year. Surface water monitoring data are submitted to UDOGM by the end of the quarter following sampling. Monitoring data are submitted in an annual summary by March 31 of the subsequent year. UPDES reporting requirements will be met for the three UPDES discharge sites at the mine (see Appendix 7-7).

To better understand the effects that mining will have, if any, on the stream flows within Box Canyon, surface water monitoring sites Pines-407 and Pines-408 will be monitored for stream flows in gallons per minute once every week during the months of June, July, August, September, and October in 1999. Starting in the year 2000, sites 407 and 408 will be monitored once a month in July, August, September, and October for a five year period. If analysis of the data shows no significant changes during this time period, monitoring at these points will be eliminated from the water monitoring program on Table 7-2. Flow measurements at these two sites will be obtained on the same day. Also, the operator will endeavor to obtain the required samples at least five days after the last precipitation event in the drainage area.

To better understand the effects that mining will have, if any, on the stream flows within the South Fork of Quitcupah, surface water monitoring sites SUFCO 006A and SUFCO 006B will be monitored quarterly starting in 2010 for stream flows in gallons per minute and once every two weeks when accessible while mining is occurring within the 15 degree angle-of-draw of the stream channel. Once mining has been completed within the angle-of draw, the sites will be monitored on a quarterly basis for two years after mining has progressed past the 15 degree angle-of-draw. If analysis of the data shows no significant changes during this time period, monitoring at these points will be eliminated from the water monitoring program on Table 7-2. Flow measurements at these two sites will be obtained on the same day.

Areas identified on Plate 7-3 as FP-1 and FP-2 will be monitored on or near October 1 of each year to determine the extent of perennial stream flow, if any, present in the East Fork of the Main Fork of Box Canyon Creek and the East Fork of the East Fork of Box Canyon Creek, respectively. Stream flows will be obtained a short distance below the point where the streams become perennial and the location will be mapped.

Monitoring points Pines 106 and USFS 109 are located at or near the points which the streams become perennial in the East Fork of Box Canyon Creek and the Main Fork of Box Canyon Creek, respectively. The drainages in the area of these two points will be monitored on or near

1. Determine if ground water discharge in the area of Pines 105 and Joes Mill Pond springs continue to discharge to the alluvium;
2. Monitor and evaluate the effects of mining on the surface and subsurface water in the Pines 310 and Pines 311 spring areas; and
3. Determine the potential for completing and operating ground water wells in the spring areas as part of the spring site mitigation activities.

The piezometers/wells completed as part of this project will be monitored on a bi-weekly basis through December 2006 or as accessible. Transducers with data loggers will be placed in several of the piezometers to record data on a more continuous basis. The monitoring frequency of the piezometers/wells after December 2006 will be dependant upon the results of the drilling investigation and the impacts to springs Pines 310, 311, 105, and the Joes Mill Pond of mining the 6LPE panel in the fall and winter of 2006.

A report detailing the results of the drilling and piezometer/ well installation and completion will be submitted to the Division by the end of October 2006. Water level data collected from the piezometers/wells will be reported to the Division electronically within two weeks at the end of each the month through December 2006. The Division will also be notified within three days via e-mail or telephone of significant changes to ground water elevations in Pines 310, 311, 105 spring areas as the 6LPE longwall panel is mined. A report compiling the water level data and interpretation of the data will be submitted to the Division by the end of January 2007.

Based on the findings of the investigation, Sufco will submit to the Division either additional plans (if water is not found in the Pines 105 and Joes Mill Pond area, additional bedrock drilling may be required to locate a suitable source of ground water) or a final plan for mitigation of the effected spring areas.

South Fork of Quitchupah Monitoring and Mitigation Plan

Sufco anticipates undermining and subsidizing a portion of the South Fork of Quitchupah beginning in 2013 when the mine starts longwalling panel 2R2S. A surface and ground water monitoring and mitigation program more intensive than the general monitoring plan described previously in this Section will be initiated in this area prior to subsidence occurring within the 15-degree angle-of-draw of the stream channel. This monitoring program will include conducting a pre-mining subsidence survey of the portion of the South Fork of Quitchupah over the 2R2S panel that will

be undermined and will incorporate a gain/loss survey of the stream channel from a location above the gate road of the 2R2S panel. Besides the existing South Fork of Quitchupah monitoring site (SUFCO 006), two additional temporary monitoring sites (SUFCO 006A and SUFCO 006B) have been identified above and below the portion of the South Fork where the monitoring of surface and/or ground water flows, and general geomorphology will occur. These new temporary monitoring sites are listed in Table 7-2 and their locations are shown on Plate 7-3. Stream monitoring sites will be monitored specifically for stream flow.

The surface and/or ground water flows at these stations will be monitored on a bi-weekly basis while mining is occurring within the 15 degree angle-of-draw of the stream channel. Once mining has been completed within the angle-of draw, the sites will be monitored on a quarterly basis for two years after mining has progressed past the 15 degree angle-of-draw. Table 7-2 presents the monitoring site numbers, monitoring parameters, and the frequency of monitoring. A report on the impacts, if any, to the stream or ground water flows, general geomorphology, location of the longwall, etc., will be provided via e-mail to the Division while mining is occurring under the stream channel.

Monitoring for subsidence cracks within the stream channel of the South Fork of Quitchupah Creek will also be part of this intensive monitoring and mitigation plan. The details of the mitigation plan are discussed in greater detail in Section 5.2.5.1 of this M&RP. The subsidence monitoring program will consist of inspecting the stream channel floor within the active 15 degree angle-of-draw on a bi-weekly basis. Mining induced subsidence effects, such as cracks, slumps, offsets, etc., will be identified, mapped, and a brief narrative of the effects will be recorded and forwarded to the Division. A report will be provided via e-mail to the Division on the results of the subsidence monitoring and mitigation activities while mining is occurring under the stream. A summary report to the Division documenting the pre- and post-mining conditions of the stream channel will be submitted 90 days after subsidence monitoring is complete for the 2R2S panel. This report will include a description of all activities and work conducted by Sufco for stream channel evaluation and mitigation. All identified impacts and mitigation efforts will be documented. The results of mitigation, if performed, will be discussed.

Prior to implementation of any mining-induced subsidence mitigation efforts in the stream channel as described in Chapter 5, a Stream Alteration Permit will be obtained from the Utah Division of Water Rights. Sufco will have the alteration permit(s) prior to undermining the South Fork of

Quitichupah stream channel since the mitigation efforts will occur as soon as possible after a need for mitigation is determined.

Every reasonable attempt will be made by Sufco to implement and follow the monitoring program schedule. If access is limited due to snow or inclement weather, the mine's effort to access the area will be documented in the report to the Division. The time of the access attempt, weather conditions, and reason(s) for failing to monitor the South Fork of Quitichupah sites will be provided in the report.

7.3.1.3 Acid- and Toxic-Forming Materials

Results of monitoring of mine discharge, surface, and groundwater, indicate that no impact to these waters from acid- and toxic-forming materials has been found in the permit and adjacent areas (Section 7.2.8.3). Parameters defining acid- and toxic-forming materials continue to be monitored as described in Volume 3 of this M&RP. In the event that acid- or toxic-forming materials are identified, they will be disposed of in the waste rock disposal area. The treatment of these materials will be handled as indicated in Volume 3 of this M&RP.

7.3.1.4 Transfer of Wells

Before final release of bond, exploration or monitoring wells will be sealed in a safe and environmentally sound manner in accordance with R645-301-631, R645-301-738, and R645-301-765. Ownership of wells will be transferred only with prior approval of the UDOGM. The conditions of such a transfer will comply with State and local laws. SUFCO will remain responsible for the management of the well until bond release in accordance with R645-301-529, R645-301-551, R645-301-631, R645-301-738, and R645-301-765.

7.3.1.5 Discharges

Three UPDES discharges are associated with the SUFCO mine. These include two mine water discharges and the sedimentation pond discharge. A description of these discharges is provided in Section 7.2.4.2.

The primary mine-water discharge consists of water from the underground mine workings that is diverted into mined-out areas now used as sumps. These sumps are used to settle out fines before discharge to the surface. This diversion is done in accordance with the requirements of R645-301-731.100 through R645-301-731.522 and R645-301-731.800. The clarified water flows